External Level Switches for Conductive Level Sensors

CE

Application
- level detection of fluid and conductive media in vessels (min. conductivity 1µS/cm but depending on the level switch)

Application Examples
- full- / empty detection in vessels and pipes
- level control in vessels
- overfill protection in vessels
- dry running protection in pipes (e.g. pump protection)

Features
- measurement signal free of DC-voltage
- only one unit for up to 4 levels
- CE-lable

Options / Accessories
- high sensitive version up to 1MOhm available
- version with wire-loop-control available


VNV-E


VNV-D


ZNV-Z


VNV-V


VNV-S


VNV-WEV


VNV-WD

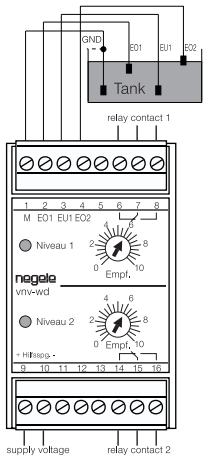

VNV-WDV

Version with 24VDC output; Power Supply 24VDC

Type	Sensitivity	Function
VNV-E	0,1...100kOhm	1 level control**; switch-on / off delay time adjustable (0,5...10sec.)
VNV-D	0,1...100kOhm	1 level control** and 1 level detection* switch-on / off delay time adjustable (0,5...10sec.)
VNV-DU	0,1...100kOhm 0,1...10KOhm	1 level control** and 1 level detection* switchable sensitivity
ZNV-Z	0,1...100kOhm	2 level detection*
VNV-V	0,1...100kOhm	4 level detection*

Version with relay output; Power Supply 230VAC (Option: 115VAC, 24VAC)

Type	Sensitivity	Function
VNV-S	0,1...100kOhm	1 level control**
VNV-SD	0,1...50kOhm	1 level control**
VNV-WEV	0,1...100kOhm	1 level control**; switch-on / off delay time adjustable (0,5...10sec.)
VNV-WD	0,1...100kOhm	1 level control** and 1 level detection*
VNV-WDV	0,1...100kOhm	1 level control** and 1 level detection* switch-on / off delay time adjustable (0,5...10sec.)
VNV-W	50kOhm fest	1 level detection*
Option H	0,1...1MOhm	



VNV-WD

Explanation considering the VNV-WD:
* Level detection: The output is switched as soon as the electrode EO2 gets contact to the medium. It's switched off again when the electrode looses contact to the medium.
** Level control: The output is switched on as soon as EU1 looses contact to the medium. It keeps switched on until the electrode EO1 gets contact. When EO1 gets contact, the output is switched off and keeps switched off until EU1 looses contact to the medium again. If you only use M and EO1 of the level control, it works like a level detection.

Order Code

version with 24VDC power supply (no further options)	version with AC power supply	high sensitive version (up to 1MOhm)	power supply
VNV-E VNV-D VNV-DU VNV-V ZNV-Z	VNV-S VNV-WEV VNV-WD, -WDV	X standard H high sensitive	230VAC* 115VAC* 42VAC 24VAC
	VNV-W VNV-SD	not possible	
	Order example:	**VNV-WEVH / 230VAC**	

* Pay attention to the note on page4!

Negele Messtechnik GmbH • Raiffeisenweg 7 • D-87743 Egg a. d. Günz • Telefon +49 (0) 83 33 / 92 04-0 • Fax +49 (0) 83 33 / 92 04-49

Technical Data for Level Switches VNV-E, VNV-D, VNV-DU, ZNV-Z, VNV-V

Style	DIN-standard case	of ABS for rail mounting acc. to EN50022
Dimensions (WxHxD)	VNV-E; VNV-D; VNV-DU; VNV-V ZNV-Z	45x75x105 22,5x75x105
Protection type		IP20; terminal guarded ag. contact
Temperature	operating / storage	-10...+55°C
Humidity	without condensation	65% r.F. max.
Electrode Voltage	free of DC voltage	1,5...2VAC/150Hz
Sensitivity	adjustable	0,1...100kOhm
Delay Time (Switch-on / off)	VNV-E; VNV-D; VNV-DU output A1 output A2	0,5...10 sec. adjustable no delay
Power Supply		24VDC (20...30VDC)
Output	active	24VDC, 100mA max (power supply -10%)
Noise Immunity	EMV acc. to	EN50081-2 v. 03/94 EN50082-2 v. 02/96
Cable Capacity	Sensor-Level Switch	2000pF max.

VNV-S, VNV-SD, VNV-WD, VNV-WDV, VNV-WEV, VNV-W

Style	DIN-standard case	of ABS for rail mounting acc. to EN50022
Dimensions	(WxHxD)	45x75x105
Protection type		IP20; terminal guarded ag. contact
Temperature	operating / storage	-10...+55°C
Humidity	without condensation	65% r.F. max.
Electrode Voltage	free of DC voltage	8...14VAC/50Hz
Sensitivity	VNV-S, -WD, -WEV VNV-SD VNV-W Option H	0,1...100kOhm 0,1...50kOhm fix 50kOhm 0,05...1MOhm
Delay Time (Switch-on / offl)	VNV-WEV, -WEVH, VNV-WDV, -WDVH	0,5...10 sec. adjustable
Power Supply	standard option	230VAC* 115VAC*; 42VAC 24VAC
Output	relay	250VAC/3A (change over contact)
Noise Immunity	EMV acc. to	EN50081-2 - 03/94 EN50082-2 - 02/96
Low Voltage Directive	acc. to	EN61010 - 1995
Cable Capacity (Sensor-Level Switch)	VNV-S; -WD; -WEV VNV-SD; VNV-W with option H	6000pF max. 25000pF max. 600pF max.

*Pay attention to the note on page 4!

Mounting Instructions

If more level switches are mounted side by side, a distance of 5mm must be provided between the level switches.
Before you switch on the level switches, check the terminals if they are fixed! This is especially important for level switches with relay output!

Startup the Level Switch

1. Configure the level switch as desired (see page 3)
   - set full- / empty function
   - set the time delay function (Switch-on / off delay) via the decode switches **(only VNV-D, VNV-DU und VNV-WEV)**
   - set the desired delay time via the poti on the front **(only VNV-D, VNV-DU und VNV-WEV)**
2. Connect the level switch according to the connection pictures on page 4.
3. Set the sensitivity poti to left (0)
4. Wetting the electrode with the medium with the lowest conductivity
5. Turn the sensitivity poti slowly to th right side until the relay is switching (LED is glowing)
6. Setup is finished

Funtion Control of the wire-loop-control

(only VNV-SD und VNV-W)

1. Disconnect the cable between sensor and level switch directly at the terminal of the sensor
2. LED "Drahtbruch" must switch on, relay "Füllstand" and "Drahtbruch" must switch off.

Configuration of the Switch Function

The configuration of the switch function is realised by the integrated decode switches "full / empty" (see page 3).

Switch Function **full**:
Sensor in the medium -> Output is active / the relay is switched on (LED is glowing)
Switch Function **empty**:
Sensor in the medium -> Output is not active, the relay is switched off (LED is off)

The level switches with wire-loop-control **(VNV-SD; VNV-W)** are fix configured to the switch function "empty". A change is not possible.

The configuration of the switch function in case of using **VNV-WD** with relay output can be realised by using the break contact (=switch function "empty") or the shutter contact (=switch function "full")

Configuration of the Delay Time

VNV-E; VNV-D; VNV-DU

For each output a switch-on or switch-off delay can be adjusted.
A combination is not possible.
decode switch "on" -> switch-on delay
decode switch "off" -> switch-off delay

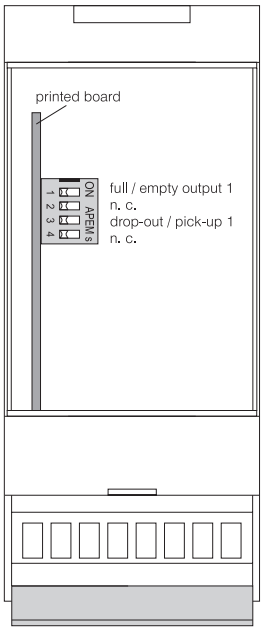
VNV-WEV:

Switch-on and Switch-off delay can be adjusted independent of each other.
switch S1 closed -> switch-on delay
switch S2 closed -> switch-off delay
switch S1+S2 closed -> switch-on and switch-off delay

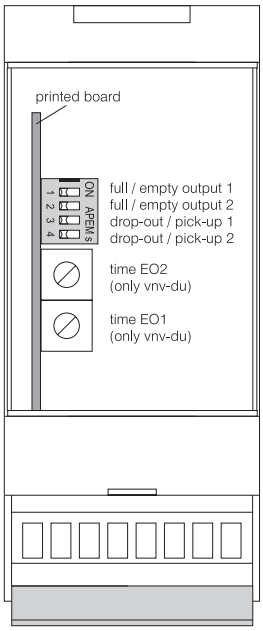
VNV-WDV:

always switch-on and switch-off delay

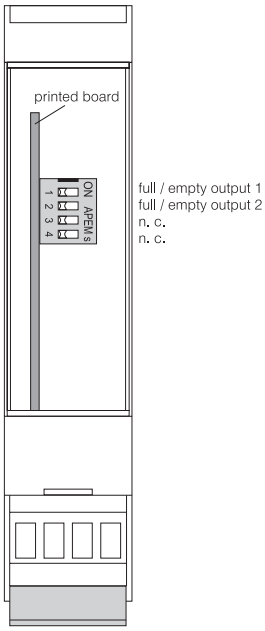
Configuration



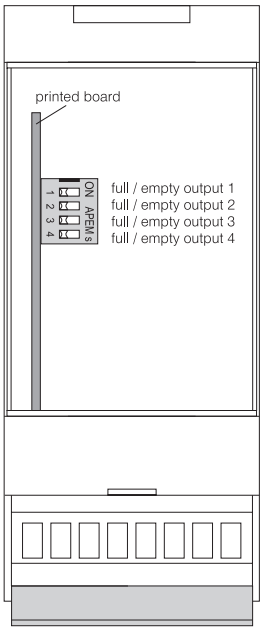
VNV-E



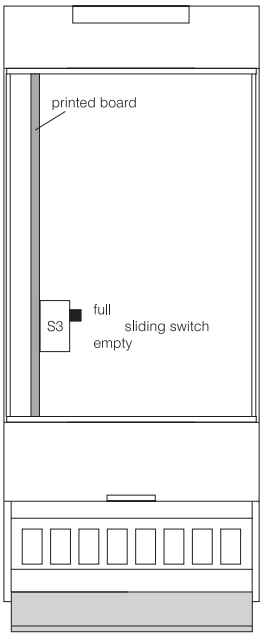
VNV-D / VNV-DU



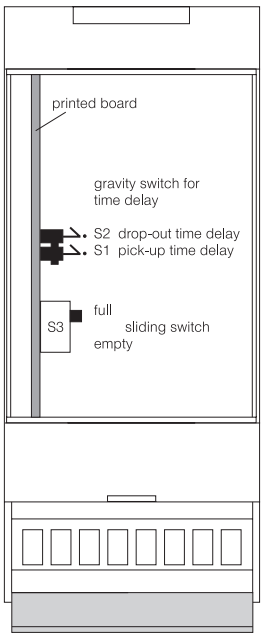
ZNV-Z



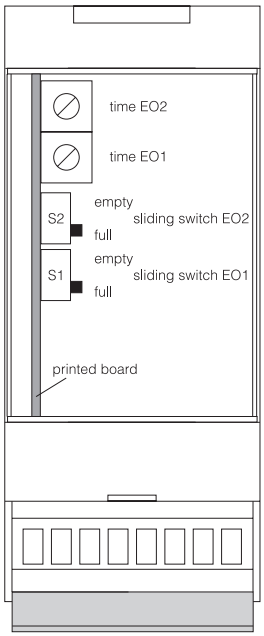
VNV-V



VNV-S



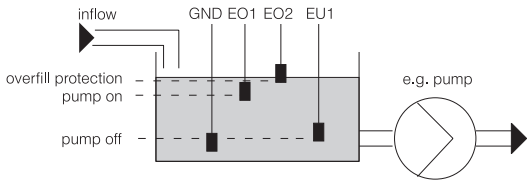
VNV-WEV



VNV-WDV

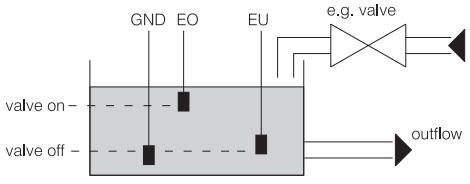
Application Examples

Level control in a vessel with additional overfill protection (e.g. with VNV-WD)



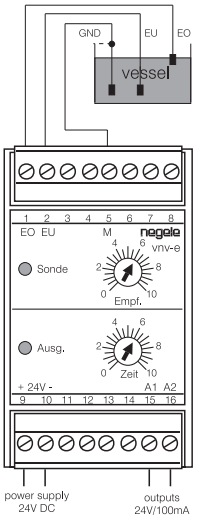
The vessel is filled via the inflow pipe. When the maximum level (EO1) is reached, the pump is switched on. As soon as the minimum level elecrode (EU1) looses contact to the medium the pump stops. The overfill electrode (EO2) prevents an overflow of the vessel in case of an error.

Level control in a vessel (e.g. with VNV-E)

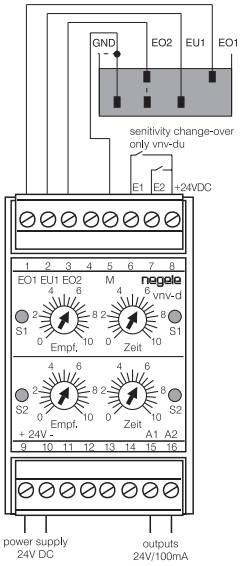


The medium is continously taken out of the vessel via the outlet in the bottom. As soon as the minimum electrode (EU) looses contact to the medium, the valve in the inflow pipe is opened and the vessel gets filled again. When the medim reaches the maximum electrode (EO) the valve is closed again and the filling stops.

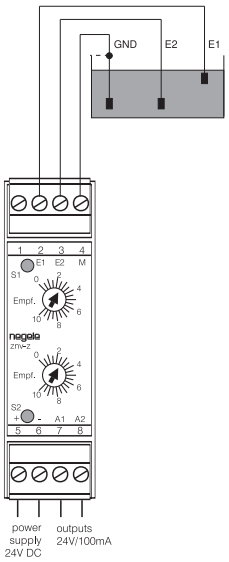
Electrical connection



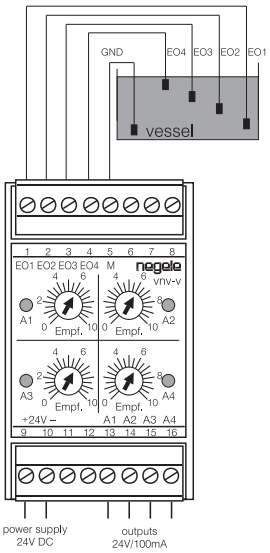
VNV-E



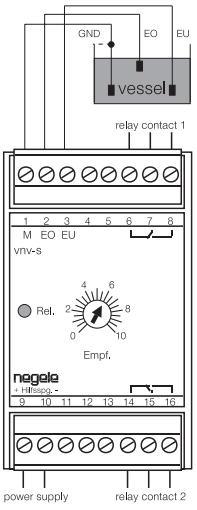
VNV-D / VNV-DU



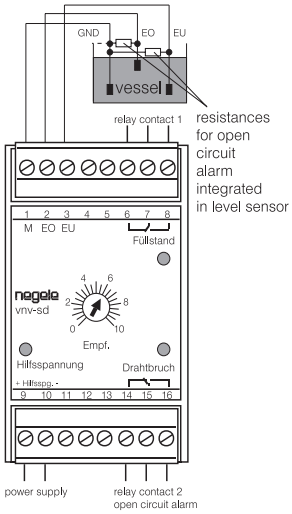
ZNV-Z



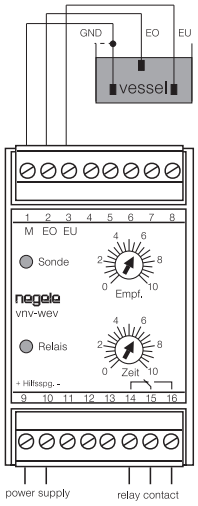
VNV-V



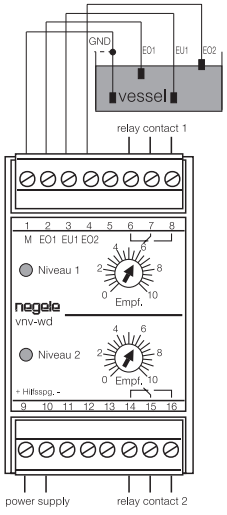
VNV-S



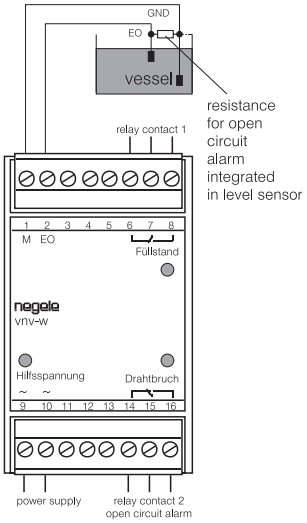
VNV-SD



VNV-WEV



VNV-WD / -WDV



VNV-W

ATTENTION:
For devices with 230VAC and 115VAC power supply it's necessary to carry out the primary protection of the transformer with a slow-blow fuse of 1A. This has to be done by the operator for each device (this does not apply to VNV-WDV).

Overview conductive level sensors

For detailed technical information and the technical data please see the specific product informations in chapter 4.

NVS-041

NVS-166

NVS-345.2.B

Summary of the technical data and types

Type	NVS-04x;06x;08x	NVS-14x;16x;18x	NVS-345
Process connection	M12 hyg.	G1/2" hyg.	G1" hyg.
Number of electrodes	1	1	2...4
Length of electrodes	2,5; 200mm	4; 200; 500; 850; 1000; 1500; 2000mm	4; 200; 500; 850; 1000; 1500; 2000mm
Material			
Electrode	316L (1.4404)	316L (1.4404)	316L (1.4404)
Coating	PFA	PFA	PFA
Isolator	PEEK	PEEK	PEEK
Thread	303 (1.4305)	303 (1.4305)	303 (1.4305)
max. Pressure	10bar	10bar	10bar
Temperature			
Cleaning	140°C/30min	140°C/30min	140°C/30min
Process	0...100°C	0...100°C	0...100°C
Compatible fitting	EMK-032	EMZ-132	EMZ-352

Negele Messtechnik GmbH • Raiffeisenweg 7 • D-87743 Egg a. d. Günz • Telefon +49 (0) 83 33 / 92 04-0 • Fax +49 (0) 83 33 / 92 04-49